Typical Oscillography Settings For the D60

GE Multilin No. GET-8480

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Description

Oscillography records contain waveforms captured at the sampling rate as well as other relay data at the point of trigger. Oscillography records are triggered by a programmable FlexLogic™ operand. Multiple oscillography records may be captured simultaneously. This technical note is meant to serve as an aid to configuring oscillography. For a complete description of the D60 oscillography feature, refer to the product manual.

The oscillography captures serve as a great tool in analyzing faults, determining wiring and/or setting errors. Proper selection of analog and digital channels in the oscillography menu assures capturing of data needed for fault analysis.

Example

The following is only intended to help the user to understand some of the critical pieces of data required to successfully analyze a fault. Channels may be substituted or added at the user's discretion. Here are the recommended digital points.

SETTING	PARAMETER
Number Of Records	5
Trigger Mode	Automatic Overwrite
Trigger Position	30 %
Trigger Source	Osc_Trig On (VO1)
AC Input Waveforms	32 samples/cycle
Digital Channel 1	PH DIR1 BLK
Digital Channel 2	PH DIST Z1 OP
Digital Channel 3	GND DIST Z1 OP
Digital Channel 4	PH DIST Z2 OP
Digital Channel 5	GND DIST Z2 OP
Digital Channel 6	PH DIST Z3 OP
Digital Channel 7	GND DIST Z3 OP
Digital Channel 8	PH DIST Z4 OP
Digital Channel 9	GND DIST Z4 OP
Digital Channel 10	PH DIST Z5 OP
Digital Channel 11	GND DIST Z5 OP
Digital Channel 12	LINE PICKUP OP
Digital Channel 13	BREAKER 1 OPEN
Digital Channel 14	BREAKER 1 CLOSED
Digital Channel 15	BREAKER 1 OOS
Digital Channel 16	BREAKER 1 PHASE A CLSD
Digital Channel 17	BREAKER 1 PHASE B CLSD
Digital Channel 18	BREAKER 1 PHASE C CLSD
Digital Channel 19	AR ENABLED
Digital Channel 20	AR RIP
Digital Channel 21	AR CLOSE BKR 1
Digital Channel 22	AR CLOSE BKR 2
Digital Channel 23	AR LO

Here is a continuation of the recommended digital points.

SETTING	PARAMETER
Digital Channel 23	AR LO
Digital Channel 24	AR RESET
Digital Channel 25	AR FORCE 3-P TRIP
Digital Channel 26	OPEN POLE OP A
Digital Channel 27	OPEN POLE OP B
Digital Channel 28	OPEN POLE OP C
Digital Channel 29	OPEN POLE BKR A OP
Digital Channel 30	OPEN POLE BKR B OP
Digital Channel 31	OPEN POLE BKR C OP
Digital Channel 32	TRIP 1-POLE
Digital Channel 33	TRIP 3-POLE
Digital Channel 34	TRIP PHASE A
Digital Channel 35	TRIP PHASE B
Digital Channel 36	TRIP PHASE C
Digital Channel 37	TRIP AR INIT 3-POLE
Digital Channel 38	SRC1 VT FUSE FAIL OP
Digital Channel 39	LOAD ENCHR OP
Digital Channel 40	POWER SWING BLOCK
Digital Channel 41	NEG SEQ DIR OC1 FWD
Digital Channel 42	NEG SEQ DIR OC1 REV
Digital Channel 43	PHASE SELECT AG
Digital Channel 44	PHASE SELECT BG
Digital Channel 45	PHASE SELECT CG
Digital Channel 46	PHASE SELECT AB
Digital Channel 47	PHASE SELECT BC
Digital Channel 48	PHASE SELECT CA
Digital Channel 49	PHASE SELECT ABG
Digital Channel 50	PHASE SELECT BCG
Digital Channel 51	PHASE SELECT CAG
Digital Channel 52	PHASE SELECT VOID
Digital Channel 53	PHASE SELECT 3P
Digital Channel 54	OFF

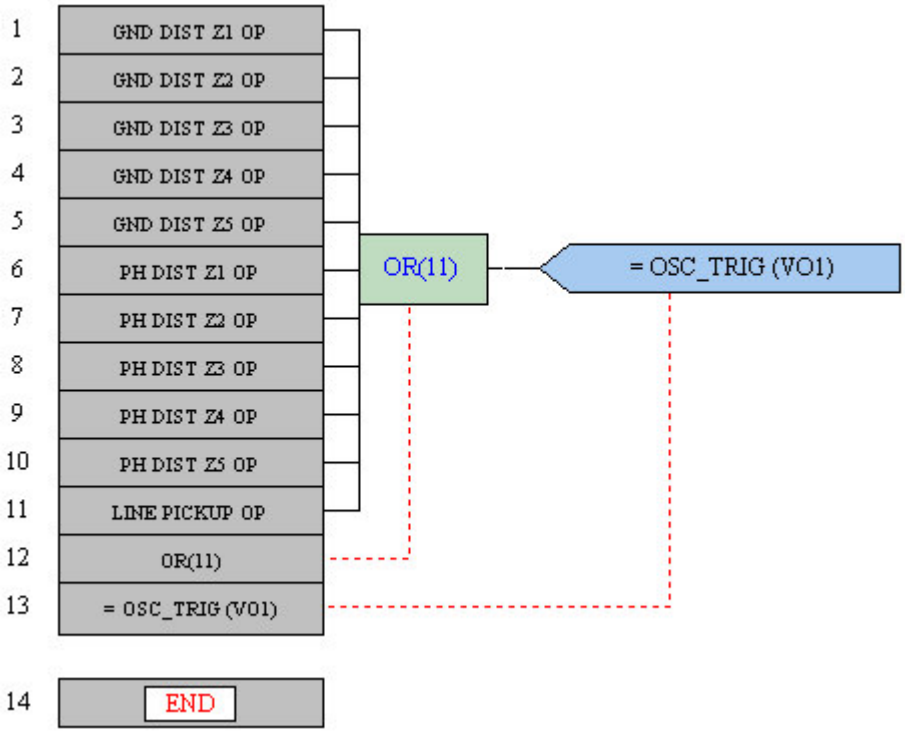
Not all of the possible digital points are included in this example. Other important points include the breaker status contacts (52a, 52b), contact inputs, contact outputs, other desired protection elements (50, 50N/G, 51, 51N/G, UV, OV), virtual inputs/outputs, remote inputs/outputs and direct inputs/outputs. These should be configured depending on the relay and system configurations. Note that all voltages and currents that are configured as sources under the system setup will automatically be included in the oscillography capture.

Here are the recommended analog points.

Digital Channel 63	OFF
Analog Channel 1	SRC1 I_0 Mag
Analog Channel 2	SRC1 I_0 Angle
Analog Channel 3	SRC1 I_1 Mag
Analog Channel 4	SRC1 I_1 Angle
Analog Channel 5	SRC1 I_2 Mag
Analog Channel 6	SRC1 I_2 Angle
Analog Channel 7	SRC1 V_0 Mag
Analog Channel 8	SRC1 V_0 Angle
Analog Channel 9	SRC1 V_1 Mag
Analog Channel 10	SRC1 V_1 Angle
Analog Channel 11	SRC1 V_2 Mag
Analog Channel 12	SRC1 V_2 Angle
Analog Channel 13	SRC1 Ia Mag
Analog Channel 14	SRC1 Ib Mag
Analog Channel 15	SRC1 Ic Mag
Analog Channel 16	Tracking Frequency

The oscillography trigger must also be configured to ensure that the data is captured at the time of the fault. The trigger source can be one of various protection elements, a trip output or a virtual output consisting of multiple protection elements. The following will show a typical FlexLogic™ equation that could drive a virtual output and thus cause an oscillography trigger.

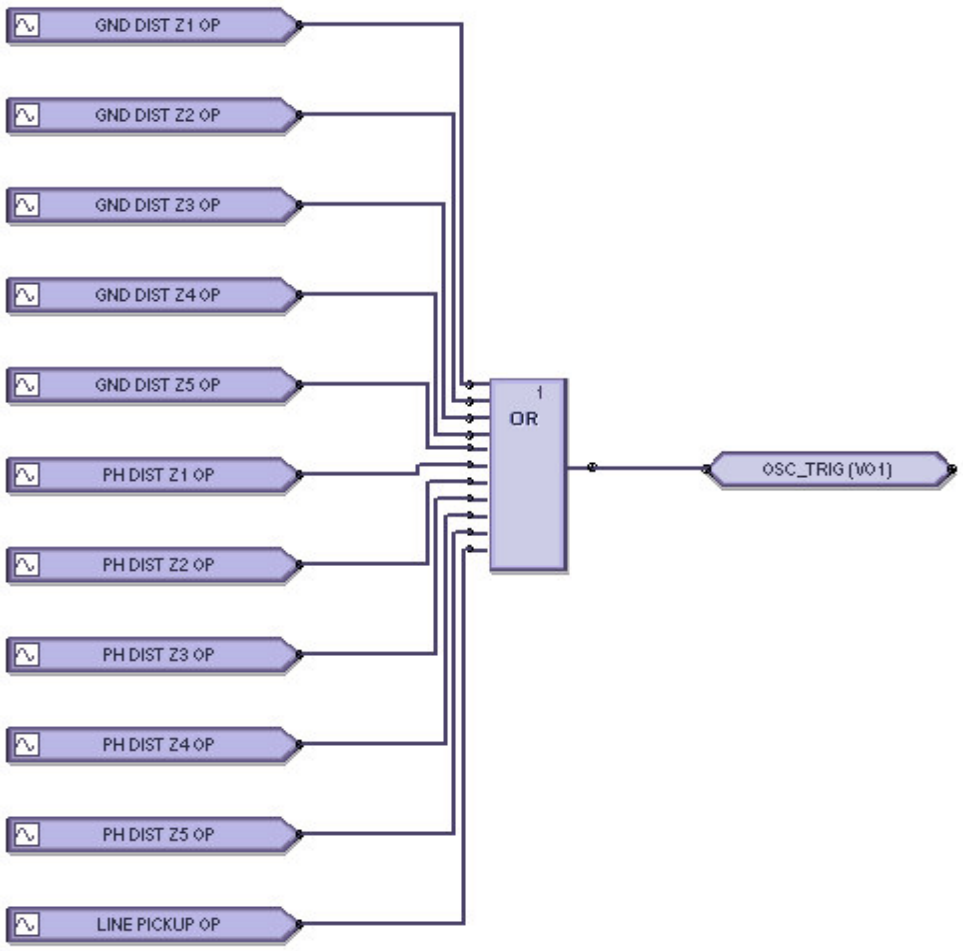
FLEXLOGIC ENTRY	TYPE	SYNTAX
View Graphic	View	View
FlexLogic Entry 1	Protection Element	GND DIST Z1 OP
FlexLogic Entry 2	Protection Element	GND DIST Z2 OP
FlexLogic Entry 3	Protection Element	GND DIST Z3 OP
FlexLogic Entry 4	Protection Element	GND DIST Z4 OP
FlexLogic Entry 5	Protection Element	GND DIST Z5 OP
FlexLogic Entry 6	Protection Element	PH DIST Z1 OP
FlexLogic Entry 7	Protection Element	PH DIST Z2 OP
FlexLogic Entry 8	Protection Element	PH DIST Z3 OP
FlexLogic Entry 9	Protection Element	PH DIST Z4 OP
FlexLogic Entry 10	Protection Element	PH DIST Z5 OP
FlexLogic Entry 11	Protection Element	LINE PICKUP OP
FlexLogic Entry 12	OR	11 Input
FlexLogic Entry 13	Write Virtual Output[Assign]	= Osc_Trig (VO1)
FlexLogic Entry 14	End of List	



These diagrams show the FlexLogic™ equation as seen in Enervista UR Setup.

The FlexLogic™ equation shown here was created using the FlexLogic™ equation editor in the enerVista UR Setup software program. EnerVista UR Setup is GE Multilin's toolset that simplifies the process of Settings Creation, Communicating to and testing of the UR relays.

You can download this software free from our website at:
http://www.geindustrial.com/multilin/software/ur/



This diagram shows the FlexLogic™ equation as seen in Enervista Viewpoint Engineer Logic Designer.

The FlexLogic™ equation shown here was created and documented using the Graphical Logic Designer from the Viewpoint Engineer software package. Viewpoint Engineer is GE Multilin's premium toolset that simplifies the process of Settings Creation, Simulation Testing and Commissioning.

You can download and try this software free for 15 days from our website at: http://www.geindustrial.com/multilin/enervista/viewpoint/engineer.htm

This oscillography trigger and FlexLogic™ equation are only intended as an example and the trigger source for each system should be different. It is important to note that the oscillography trigger is automatically included in the oscillography capture.

The number of records, number of samples per cycle and trigger position should also be adjusted to allow for an adequate amount of data to be captured in the oscillography. For a full explanation of these settings, please refer to the product manual.